

Claims:

1. Method of coloring porous material, which comprises contacting the material being colored, with

a) a capped diazonium compound of formula



wherein

A^+ is a cationic radical of an organic compound,

B is a radical of an unsubstituted or substituted, aliphatic or aromatic amine,

An is an anion,

and

b) optionally a coupling component.

2. Method according to claim 1, which comprises contacting the material being colored, with

a) a capped diazonium compound of formula (1)

wherein

A^+ is a cationic radical of unsubstituted phenyl; naphthyl; thiophenyl; 1,3-thiazolyl;

1,2-thiazolyl; 1,3-benzothiazolyl; 2,3-benzothiazolyl; imidazolyl; 1,3,4-thiadiazolyl;

1,3,5-thiadiazolyl; 1,3,4-triazolyl; pyrazolyl; benzimidazolyl; benzopyrazolyl; pyridinyl;

quinolinyl; pyrimidinyl; isoxazolyl; aminodiphenyl; aminodiphenylether and azobenzenyl or

A^+ is cationic radical of a phenyl, naphthyl, thiophenyl, 1,3-thiazolyl, 1,2-thiazolyl,

1,3-benzothiazolyl, 2,3-benzothiazolyl, imidazolyl, 1,3,4-thiadiazolyl, 1,3,5-thiadiazolyl,

1,3,4-triazolyl, pyrazolyl, benzimidazolyl, benzopyrazolyl, pyridinyl, quinolinyl, pyrimidinyl and

isoxazolyl, aminodiphenyl, aminodiphenylether and azobenzenyl, each of which is mono- or

poly-substituted by C_1 - C_4 alkyl, C_1 - C_4 alkoxy, C_1 - C_4 alkylthio, quaternised ammonium radicals,

halogen, e.g. fluorine, bromine or chlorine, nitro, trifluoromethyl, CN, SCN, C_1 - C_4 alkylsulfonyl,

phenylsulfonyl, benzylsulfonyl, di- C_1 - C_4 alkylaminosulfonyl, C_1 - C_4 alkyl-carbonylamino,

C_1 - C_4 alkoxysulfonyl or by di-(hydroxy- C_1 - C_4 alkyl)-aminosulfonyl, or

A^+ is a cationic radical of an organic dye, and

B is a radical of formula $-NR_{65}R_{66}$, wherein R_{65} is hydrogen; or unsubstituted linear or

branched C_1 - C_6 alkyl or linear or branched C_1 - C_6 alkyl, which is substituted by one or more

identical or different substituent selected from the group consisting of OC_1 - C_4 alkyl, $COOH$,

COO^- , $COOC_1$ - C_2 alkyl, SO_3H , SO_3^- , NH_2 , CN, halogen and OH, O^- ; and R_{66} is unsubstituted

linear or branched C_1 - C_6 alkyl or linear or branched C_1 - C_6 alkyl, which is substituted by one or

more identical or different substituent selected from the group consisting of $\text{OC}_1\text{-C}_4\text{alkyl}$, COOH , COO^- , $\text{COOC}_1\text{-C}_2\text{alkyl}$, SO_3H , SO_3^- , NH_2 , CN , halogen and OH , O^- ; or

B is a radical of unsubstituted aniline; or a radical of unsubstituted aminonaphthalene; the radical of aniline or aminonaphthalene, wherein the phenyl or the naphthyl ring is substituted by one or more identical or different substituent selected from the group consisting of COOH , COO^- , SO_3H , SO_3^- , CN , halogen, $\text{SO}_2\text{C}_1\text{-C}_2\text{alkyl}$, unsubstituted linear or branched $\text{C}_1\text{-C}_4\text{alkyl}$, linear or branched $\text{C}_1\text{-C}_4\text{alkyl}$, substituted by OH , O^- , COOH , COO^- , $\text{COC}_1\text{-C}_2\text{alkyl}$ or $\text{SO}_2\text{-N(C}_1\text{-C}_4\text{alkyl)-(CH}_2\text{)}_{1-4}\text{SO}_3\text{H}$ and wherein the amino radical is substituted by hydrogen, unsubstituted linear or branched $\text{C}_1\text{-C}_4\text{alkyl}$ or linear or branched $\text{C}_1\text{-C}_4\text{alkyl}$, substituted by OH , O^- , or COOH , COO^- ;

An is an anion,

and

b) a coupling component.

3. Method according to any of the precedings claims, wherein A^+ is a cationic radical of unsubstituted phenyl; naphthyl; thiophenyl; 1,3-thiazolyl; 1,2-thiazolyl; 1,3-benzothiazolyl; 2,3-benzothiazolyl; imidazolyl; 1,3,4-thiadiazolyl; 1,3,5-thiadiazolyl; 1,3,4-triazolyl; pyrazolyl; benzimidazolyl; benzopyrazolyl; pyridinyl; quinolinyl; pyrimidinyl; isoxazolyl; aminodiphenyl; aminodiphenylether and azobenzenyl or

A^+ is cationic radical of a phenyl, naphthyl, thiophenyl, 1,3-thiazolyl, 1,2-thiazolyl, 1,3-benzothiazolyl, 2,3-benzothiazolyl, imidazolyl, 1,3,4-thiadiazolyl, 1,3,5-thiadiazolyl, 1,3,4-triazolyl, pyrazolyl, benzimidazolyl, benzopyrazolyl, pyridinyl, quinolinyl, pyrimidinyl and isoxazolyl, aminodiphenyl, aminodiphenylether and azobenzenyl, each of which is mono- or poly-substituted by $\text{C}_1\text{-C}_4\text{alkyl}$, $\text{C}_1\text{-C}_4\text{alkoxy}$, $\text{C}_1\text{-C}_4\text{alkylthio}$, halogen, e.g. fluorine, bromine or chlorine, nitro, trifluoromethyl, CN , SCN , $\text{C}_1\text{-C}_4\text{alkylsulfonyl}$, phenylsulfonyl, benzylsulfonyl, di- $\text{C}_1\text{-C}_4\text{alkylaminosulfonyl}$, $\text{C}_1\text{-C}_4\text{alkyl-carbonylamino}$, $\text{C}_1\text{-C}_4\text{alkoxysulfonyl}$ or by di-(hydroxy- $\text{C}_1\text{-C}_4\text{alkyl}$)-aminosulfonyl, or

A^+ is a cationic radical residue of an organic dye selected from anthraquinon dye, acridine dye, azo dye, azomethine dye, hydrazomethine, benzodifuranone dye, coumarin dye, diketopyrrolopyrrol dye, dioxazine dye, diphenylmethane dye, formazan dye, indigoid dye, indophenol, naphthalimide dye, naphthoquinone dye, nitroaryl dye, merocyanine dye, methine dye, oxazine dye, perinone dye, perylene dye, pyrenequinone dye, phthalocyanine dye, phenazine dye, quinonimine dye, quinacridone dye, quinophtalone dye, styryl dye, triphenylmethane dye, xanthene dye, thiazine dye and thioxanthene dye, and

- 70 -

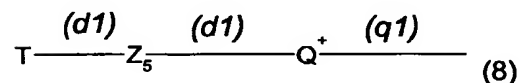
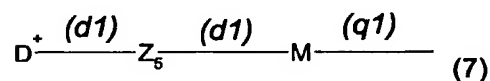
B is a radical of formula $-\text{NR}_{65}\text{R}_{66}$, wherein R_{65} is hydrogen; or unsubstituted linear or branched $\text{C}_1\text{-C}_6$ alkyl or linear or branched $\text{C}_1\text{-C}_6$ alkyl, which is substituted by one or more identical or different substituent selected from the group consisting of $\text{OC}_1\text{-C}_4$ alkyl, COOH , COO^- , $\text{COOC}_1\text{-C}_2$ alkyl, SO_3H , SO_3^- , NH_2 , CN , halogen and OH , O^- and R_{66} is unsubstituted linear or branched $\text{C}_1\text{-C}_6$ alkyl or linear or branched $\text{C}_1\text{-C}_6$ alkyl, which is substituted by one or more identical or different substituent selected from the group consisting of $\text{OC}_1\text{-C}_4$ alkyl, COOH , COO^- , $\text{COOC}_1\text{-C}_2$ alkyl, SO_3H , SO_3^- , NH_2 , CN , halogen, OH and O^- .

4. Method according to any of the precedings claims, wherein A^+ is a cationic radical of an organic dye selected from azo dye, azomethin dye, hydrazomethin dye, merocyanine dye, methin dye and styryl dye.

5. A method according to any of the precedings claims, wherein there is used as a coupling component an unsubstituted or substituted acylacetarylamine, phenol, naphthol, pyridine, quinolone, pyrazole, indole, diphenylamine, aniline, aminopyridine, pyrimidone, naphthylamine, aminothiazole, thiophene or hydroxypyridine.

6. A method according to any of the precedings claims, wherein a coupling component is used, which is mono- or poly-substituted by amino, alkylamino, dialkylamino, halogen, alkyl, alkoxy, phenyl, naphthyl or aryloxy.

7. Method according to any of the precedings claims, wherein A^+ is a cationic radical of a dye of formulae (7) and (8)



wherein

Z_5 is a biradical selected from:

$-\text{N}=\text{N}-$, $-\text{CR}_6=\text{N}-$, $-\text{N}=\text{CR}_7-$, $-\text{NR}_8-\text{N}=\text{CR}_9-$, $-\text{R}_{10}\text{C}=\text{N}-\text{NR}_{11}-$, $-\text{CR}_6=\text{CR}_6-$,

wherein

R_6 , R_7 , R_8 , R_9 , R_{10} and R_{11} are each independently of the other hydrogen, or unsubstituted or substituted $\text{C}_1\text{-C}_{14}$ alkyl, allyl, $-\text{C}_5\text{-C}_{10}$ aryl, $-\text{C}_1\text{-C}_{10}$ alkylen($\text{C}_5\text{-C}_{10}$ aryl),

- 71 -

-C₅-C₁₀arylen-(C₁-C₁₀alkyl), and

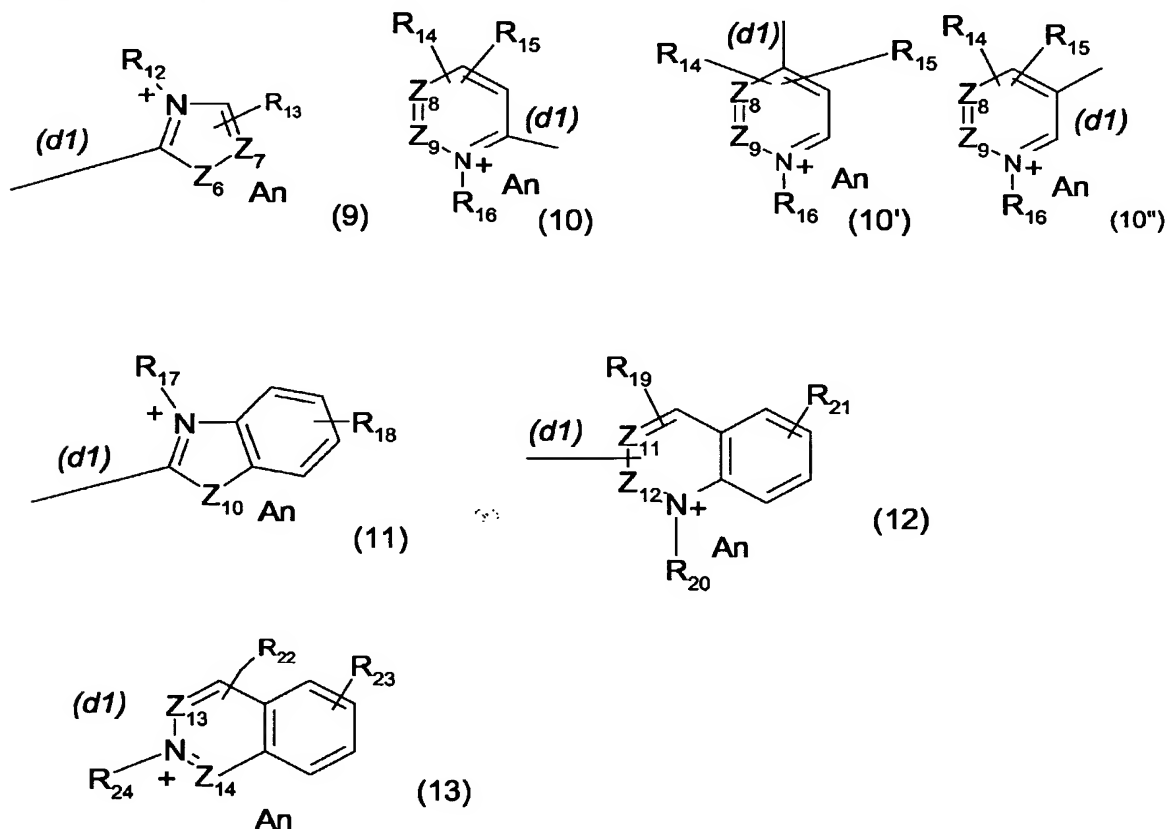
D⁺ is a radical of a cationic, aromatic, substituted or unsubstituted heterocyclic compound,

M is a biradical of an aromatic substituted or unsubstituted compound,

T is a radical of an aromatic substituted or unsubstituted compound, and

Q⁺ is a biradical of an aromatic, substituted or unsubstituted heterocyclic compound.

8. Method according to claim 7, wherein D⁺ is a radical of a cationic aromatic substituted or unsubstituted heterocyclic compound of formulae (9), (10), (10'), (10''), (11), (12) or (13)

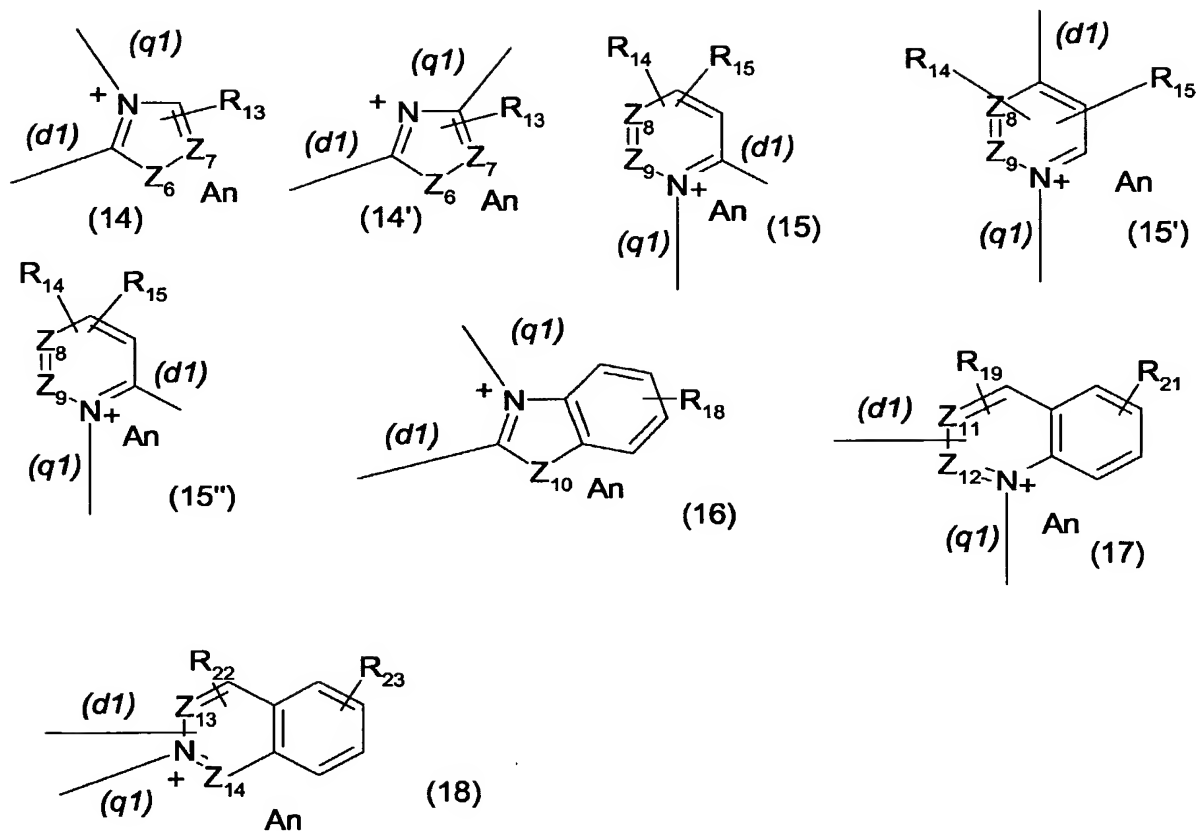


wherein

(d1) is a bond of formula (7) as defined in claim 7;

and

Q⁺ is a biradical of a cationic aromatic substituted or unsubstituted heterocyclic compound of formulae (14), (14'), (15), (15'), (15''), (16), (17) or (18)

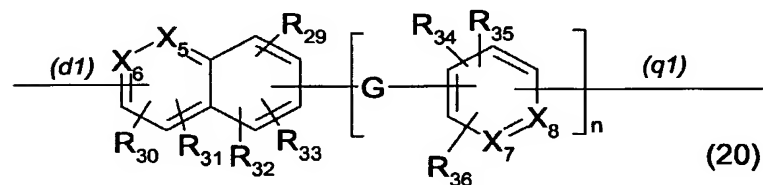
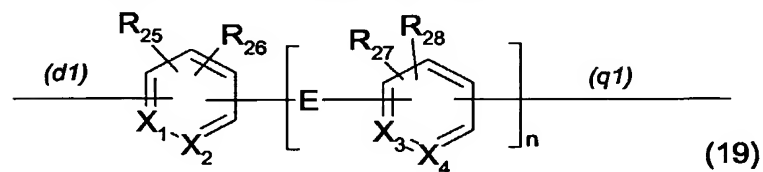


wherein

(d1) and (q1) are a bond to Z₅ of formula (8) as defined in claim 7,

and

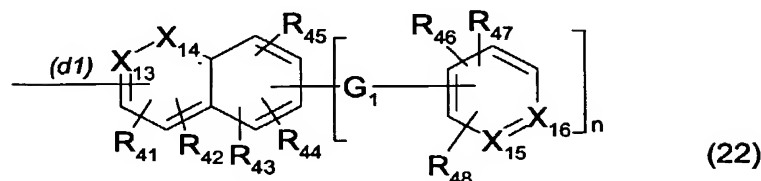
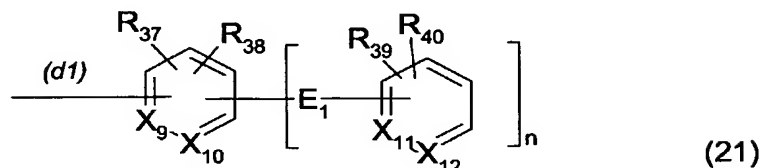
M is a biradical of formulae (19) or (20),



wherein

(d1) and (q1) are a bond of formula (7) as defined in claim 7, and

T is a radical of compounds of formulae (21) or (22),



wherein

(d1) is a bond of formula (8) as defined in claim 7, and

wherein

X₁, X₂, X₃, X₄, X₅, X₆, X₇, X₈, X₉, X₁₀, X₁₁, X₁₂, X₁₃, X₁₄, X₁₅ and X₁₆ are independently from each other N or a radical of CR₄₉,

Z₆ is O or S or a radical of NR₅₀,

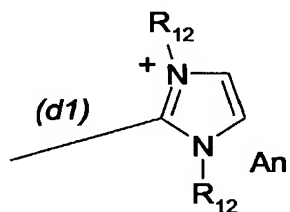
Z₇, Z₈, Z₉, Z₁₀, Z₁₁, Z₁₂, Z₁₃ and Z₁₄ are independently from each other N or a radical of CR₅₁;

E, E₁, G and G₁ are independently from each other -O-, -S-, -(SO₂)-, -C₁-C₁₀alkylen, or -(NR₅₂)-;

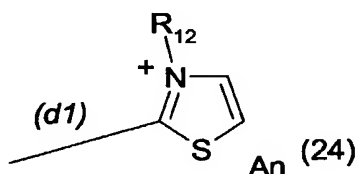
R₁₃, R₁₄, R₁₅, R₁₈, R₁₉, R₂₁, R₂₂, R₂₃, R₂₅, R₂₆, R₂₇, R₂₈, R₂₉, R₃₀, R₃₁, R₃₂, R₃₃, R₃₄, R₃₅, R₃₆, R₃₇, R₃₈, R₃₉, R₄₀, R₄₁, R₄₂, R₄₃, R₄₄, R₄₅, R₄₆, R₄₇, R₄₈, R₄₉ and R₅₁ are independently from each other hydrogen, halogen, C₁-C₁₄alkyl, which is saturated or unsaturated, linear or branched, substituted or unsubstituted, or interrupted or uninterrupted with heteroatoms; a radical of phenyl, which substituted or unsubstituted; a radical of carboxylic acid; a radical of hydroxy, nitril, C₁-C₁₆alkoxy, (poly)-hydroxy-C₂-C₄-alkoxy, carboxylic acid, sulfonic acid; halogen, sulfonylamino, SR₆₀, NHR₅₃ or NR₅₄R₅₅, OR₆₁, SO₂, COOR₆₂, NR₅₆COR₅₈, CONR₅₇; and R₁₂, R₁₆, R₁₇, R₂₀, R₂₄, R₅₀, R₅₂, R₅₃, R₅₄, R₅₅, R₅₆, R₅₇, R₅₈, R₆₀, R₆₁ and R₆₂ are each independently of the other hydrogen, unsubstituted or substituted C₁-C₁₄alkyl, allyl, -C₅-C₁₀arylen-(C₁-C₁₀alkyl), -C₁-C₁₀alkylen(C₅-C₁₀aryl), C₅-C₁₀aryl, and

An is an anion.

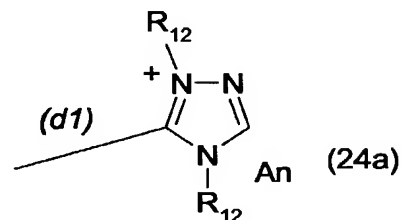
9. Method according to any of precedings claims, wherein D^+ is a radical of a cationic aromatic substituted or unsubstituted heterocyclic compound of formulae (23), (24), (24a), (25), (26), (26a) or (27)



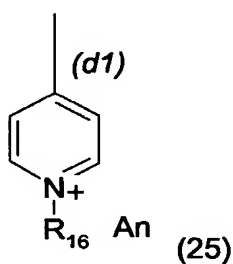
(23)



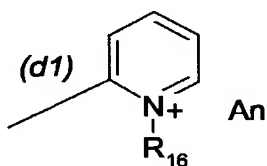
(24)



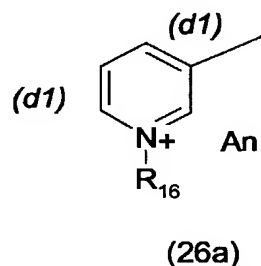
(24a)



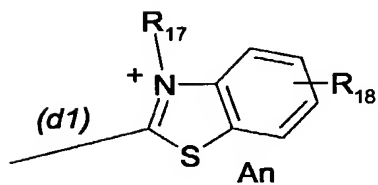
(25)



(26)



(26a)



(27)

wherein

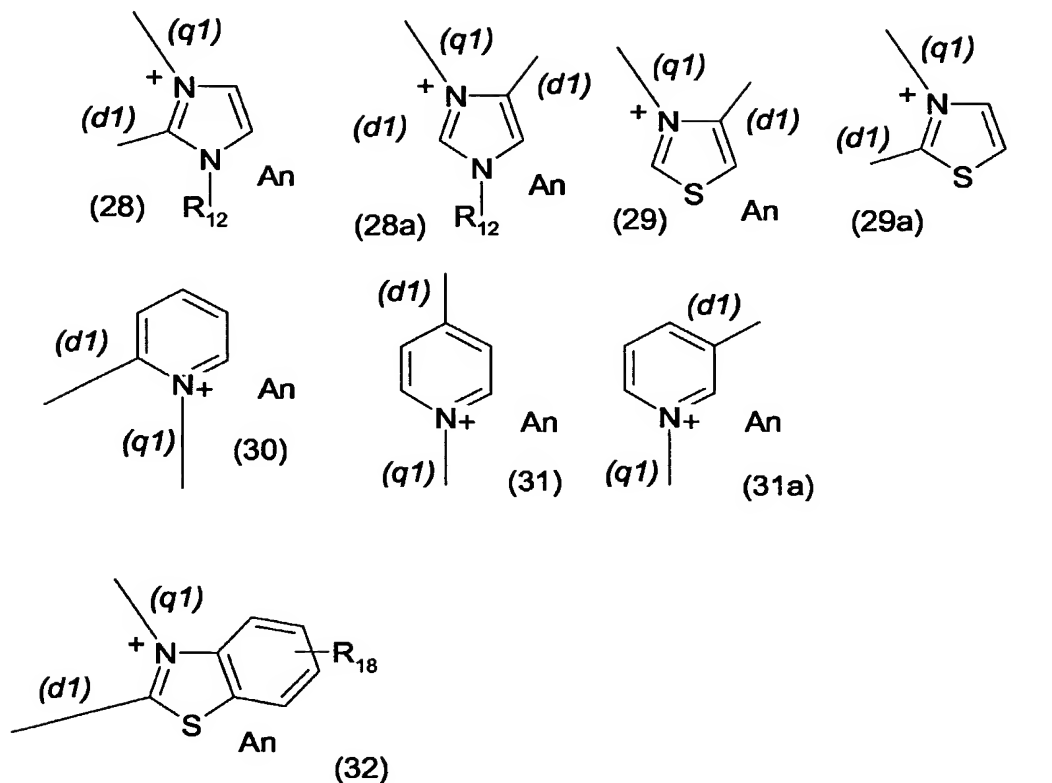
(d1) and (q1) are a bond of formula (7) as defined in claim 7, and

An, R₁₂, R₁₆, R₁₇ and R₁₈ have the same meaning as given in claim 8,

and

Q^+ is a biradical of a cationic aromatic substituted or unsubstituted heterocyclic compound of formulae (28), (28a), (29), (29a), (30), (31), (31a) or (32)

- 75 -



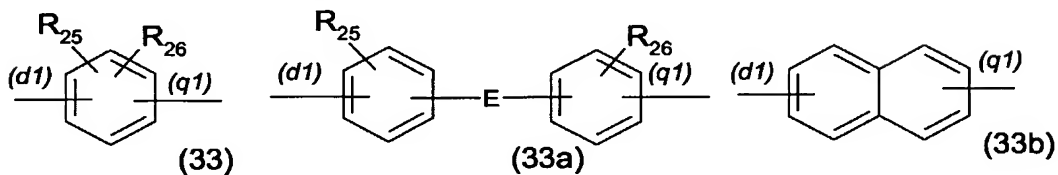
wherein

(d1) and (q1) are bond of formula (8) as defined in claim 7, and

An, R₁₂ and R₁₈ have the same meaning as given in claim 8,

and

M is a biradical of formulae (33), (33a) or (33b),



wherein

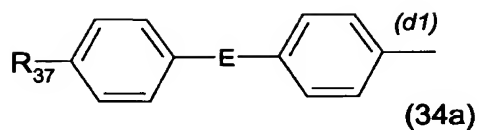
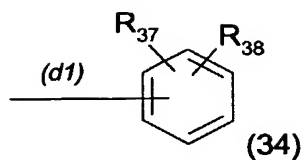
(d1) and (q1) are bond of formula (7) as defined in claim 7, and

E, R₂₅ and R₂₆ have the same meaning as given in claim 8;

and

T is a radical of formulae (34) or (34a),

- 76 -

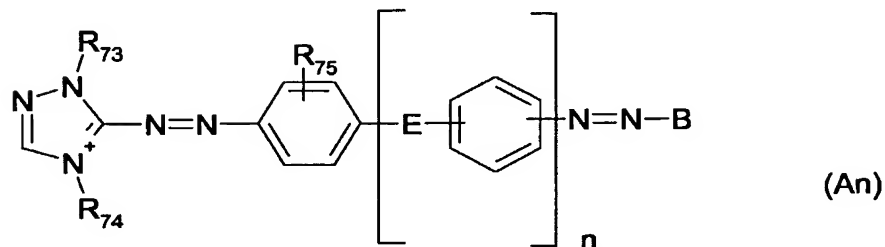
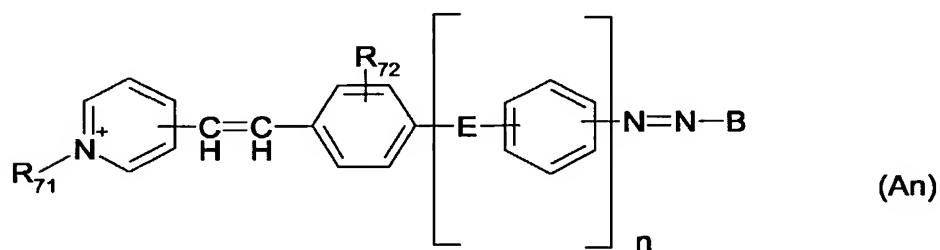
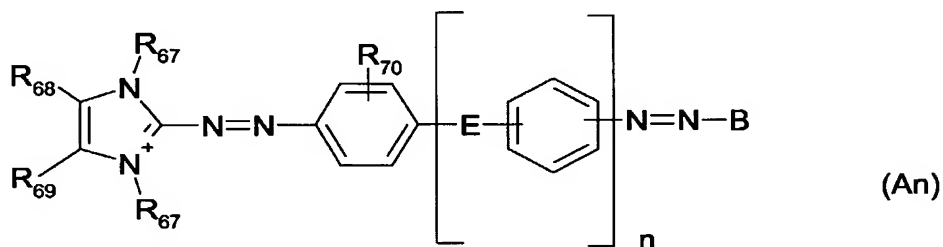


wherein

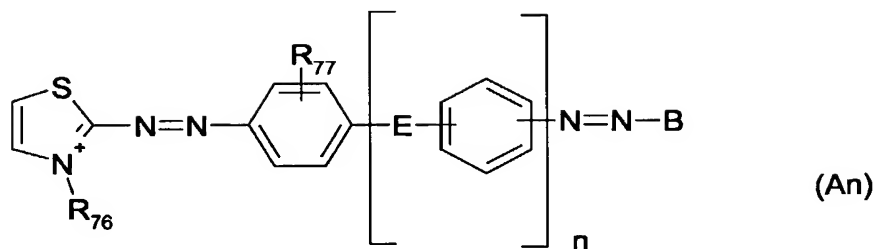
R_{37} , R_{38} and E has the same definition as given in claim 8, and
 (d1) is a bond of compound of formula (8) as defined in claim 7.

10. Method according to any of the precedings claims, which comprises contacting the material being colored, with

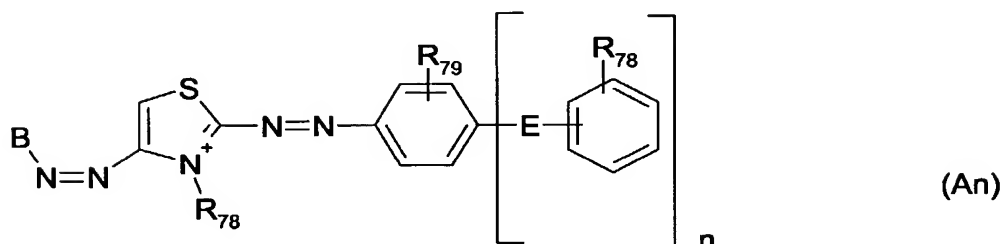
a) at least a single capped diazonium compound selected from the group of compounds of the following formulae



- 77 -



and



wherein

E is $-O-$, $-S-$, $-(SO_2)-$, CR_{80} or a radical of $-(NR_{81})-$;

R_{70} , R_{72} , R_{75} , R_{77} , R_{78} , R_{79} , R_{80} and R_{81} are independently from each other hydrogen, C_1 - C_{16} alkyl, which is saturated or unsaturated, linear or branched, substituted or unsubstituted, or interrupted or uninterrupted with heteroatoms, such as, by hydroxy, nitro, amino, C_1 - C_2 alkoxy, (poly)-hydroxy- C_2 - C_4 -alkoxy, di- C_1 - C_2 alkylamino, carboxylic acid, sulfonic acid; a radical of phenyl, which substituted or unsubstituted; a radical of carboxylic acid; a radical of sulfonylamino, S, NH or $N(C_1$ - C_4 alkyl), O, halogen, SO_2 , COO, OCO, NHCO, CONH, $CON(C_1$ - C_4 alkyl) or $N(C_1$ - C_4 alkyl)CO; or are independently from each other an aliphatic or aromatic, substituted;

R_{68} with R_{69} have the same meaning as R_{70} , R_{72} , R_{75} , R_{77} , R_{78} , R_{79} , R_{80} and R_{81} as given above, or

R_{68} with R_{69} can build up an aromatic carbon cycle;

R_{67} , R_{71} , R_{73} , R_{74} , R_{76} and R_{78} are unsubstituted or substituted C_1 - C_{14} alkyl, allyl, $-C_5$ - C_{10} arylen- $(C_1$ - C_{10} alkyl), $-C_1$ - C_{10} alkylen- $(C_5$ - C_{10} aryl), C_5 - C_{10} aryl;

B, An and n have the same meaning as given in claim 2;

and

b) a coupling component.

- 78 -

11. Compounds of formula (1)

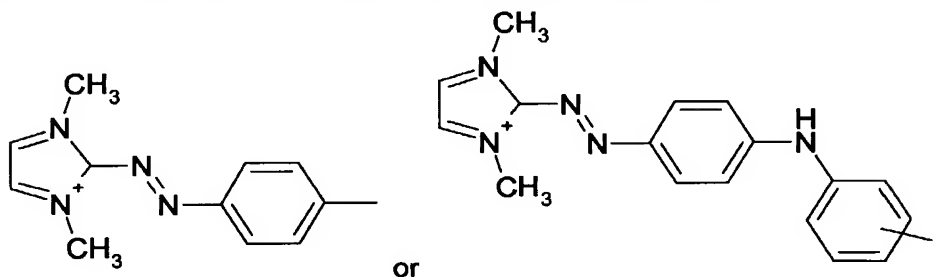


wherein

A⁺ is a cationic radical of an organic compound,

B is a radical of an unsubstituted or substituted, aliphatic or aromatic amine,

An is an anion, with the proviso that A⁺ is not a radical of formula



12. A composition comprising at least a single capped diazonium compound of formula (1) as defined above in claim 1 and a coupling component.

13. A composition according to claim 12 comprising in addition at least a single direct dye, and/or at least a single oxidative dye and/or an oxidative agent.

14. Composition according to any one of claims 12 or 13 in form of a shampoo, conditioner, gel or emulsion.

15. A method according to any one of claims 1 to 10 for dyeing or tinting human hair.